

REMARKS

The Office Action dated December 12, 2007 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-14 are currently pending in the application. Claim 12 has been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter has been added. Claims 1-14 are respectfully submitted for consideration.

The Office Action objected to claim 12 because the limitation, “the fourth rotary shaft motor” lacks antecedent basis. Claim 12 has been amended to be dependent upon claim 8, which provides antecedent basis for “the fourth rotary shaft motor.” Accordingly, Applicants submit that this objection is rendered moot and should be withdrawn.

The Office Action rejected claims 1, 3, 4, 13, and 14 under 35 U.S.C. §102(e) as being anticipated by Hattori (U.S. Patent No. 6,802,382). This rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 2-14 are dependent, recites a legged mobile robot equipped with legs each having a hip joint that connects a body with a thigh link, a knee joint that connects the thigh link with a shank link, and an ankle joint that connects the shank link with a foot to move by driving each leg. Each of the hip joints comprises a first rotary shaft that provides a degree of freedom to rotate about a yaw axis, a second rotary shaft that provides a degree of freedom to rotate about a roll axis, and a third rotary

shaft that provides a degree of freedom to rotate about a pitch axis, and a fourth rotary shaft that provides a redundant degree of freedom.

Therefore, embodiments of the invention provide a legged mobile robot configured to increase the amount of body bending and the moveable range of the legs, thereby improving the degree of posture and gait freedom without degrading the ability of the body to accommodate equipment internally (see Specification, page 2).

As will be discussed below, Hattori fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Hattori discloses a legged mobile robot having at least a plurality of movable legs. The robot includes a relative movement measurement sensor arranged on the foot sole of each movable leg for measuring the amounts of relative movements between the foot part and the road surface. The robot further includes a controller for controlling the movements of the legged mobile robot based on the amounts of relative movements between the foot part and the road surface as measured by the relative movement measurement sensor. FIG. 9 of Hattori shows the structure of the degree of joint freedom owned by the legged mobile robot 100. The legged mobile robot 100 is made up of an upper body portion including two arms and a head 1, a lower limb comprised of two feet for realizing the movement operations, and a body trunk portion interconnecting the upper limb and the lower limb. Left and right feet, forming the lower limb, are each made up of a hip joint yaw axis 16, a hip joint pitch axis 17, a hip joint roll axis 18, a hip joint pitch axis 19, an ankle joint pitch axis 20, an ankle joint roll axis 21 and a foot 22.

The point of intersection of the hip joint pitch axis 17 and the hip joint roll axis 18 defines a hip joint position of the robot 100.

Applicants respectfully submit that Hattori fails to disclose or suggest all of the elements of the present claims. For example, Hattori does not disclose or suggest that each hip joint includes “a fourth rotary shaft that provides a redundant degree of freedom,” as recited in claim 1.

Hattori, as illustrated in Fig. 9, only discloses that each of the hip joints include a first rotary shaft (hip joint yaw axis 16), a second rotary shaft (hip joint roll axis 18), and a third rotary shaft (hip joint pitch axis 17). Hattori fails to disclose or suggest that the hip joint includes a fourth rotary shaft that provides a redundant degree of freedom, as recited in claim 1. The Office Action cited a “fourth rotary axis” in Fig. 7 of Hattori as allegedly corresponding to the claimed fourth rotary shaft (Office Action, page 3). However, the cited “fourth rotary axis” in Fig. 7 of Hattori is not a rotary shaft providing a redundant degree of freedom. Rather, this element of Hattori is an output shaft of a motor for driving the hip joint pitch axis 17.

Thus, Hattori fails to disclose or suggest that each hip joint includes “a fourth rotary shaft that provides a redundant degree of freedom,” as recited in claim 1. Applicants therefore respectfully request that the rejection of claim 1 be withdrawn.

Claims 2-14 are dependent upon claim 1. As such, Applicants respectfully submit that claims 2-14 should be allowed for at least their dependence upon claim 1, and for the specific limitations recited therein.

Claims 2 and 5-12 were objected to as being dependent upon a rejected base claim but were indicated as being allowable if rewritten in independent form. As discussed above, Applicants submit that claim 1 recites subject matter which is neither disclosed nor suggested by Hattori. Therefore, claims 2 and 5-12, which are dependent upon claim 1, should be allowed in their current form.

For at least the reasons discussed above, Applicants respectfully submit that Hattori fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-14 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Majid S. AlBassam
Registration No. 54,749

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

MSA:jf